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06/11/01 02:58 PM

To: Amy Platt/P2/R8/USEPA/US@EPA  
cc:  
Subject: ND CEM emissions analysis



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Preliminary analysis of North Dakota Power Plant CEM data for 1999 and 2000, and calculated PSD increment consuming emissions suggested by EPA and ND analyses.

Source	Current 24-hr avg Allowable Emission Limit	Source Type	Baseyear Emissions		1999 Actual Emissions			2000 Actual Emissions			Incr. emiss: EPA Prop. 2yr @ 90%	Incr. emiss: ND Allow- ables
			24 hr	Annual	Max 24 Hour	90 % 24 Hour	Annual	Max 24 Hour	90% 24 Hour	Annual		
Antelope Valley Units 1 and 2	Combined limit U1&2 3845 lb/hr <sup>1</sup>	PSD	NA	NA	4350 lb/hr	3620 lb/hr	15516 tons/yr	4940 lb/hr	3291 lb/hr	13047 tons/yr	3598 lbs/hr	3845 lbs/hr
Coyote Sta	5335 lb/hr	PSD	NA	NA	5799 lb/hr	5126 lb/hr	20040 ton/yr	5115 lb/hr	4655 lb/hr	14521 ton/yr	5077 lb/hr	5335 lbs/hr
Coal Creek Unit 1	6336 lb/hr <sup>1</sup>	PSD	NA	NA	7744 lb/hr	7194 lb/hr	23551 ton/yr	5287 lb/hr	4195 lb/hr	14332 ton/yr	6814 lb/hr	6336 lbs/hr
Coal Creek Unit 2	6336 lb/hr <sup>1</sup>	PSD	NA	NA	7175 lb/hr	6891 lb/hr	26192 ton/yr	4608 lb/hr	3552 lb/hr	12817 ton/yr	6775 lb/hr	6336 lbs/hr
M R Young Unit 1	7500 lb/hr	Baseline	7500 lb/hr <sup>2</sup>	32850 ton/yr <sup>2</sup>	7088 lb/hr	5575 lb/hr	19481 ton/yr	7082 lb/hr	5599 lb/hr	18095 ton/yr	0 <sup>3</sup>	0 <sup>1</sup>
M R Young Unit 2	5635 lb/hr	Baseline	5635 lb/hr <sup>2</sup>	24682 ton/yr <sup>2</sup>	7535 lb/hr	6161 lb/hr	21863 ton/yr	6838 lb/hr	6089 lb/hr	21134 ton/yr	493 lb/hr <sup>3</sup>	0 <sup>1</sup>
Leland Olds Unit 1	6930 lb/hr	Baseline	4774 lb/hr	8551 ton/yr	5956 lb/hr	4891 lb/hr	16802 ton/yr	5970 lb/hr	4965 lb/hr	16864 ton/yr	157 lb/hr <sup>3</sup>	2156 lb/hr <sup>3</sup>
Leland Olds Unit 2	13668 lb/hr	Baseline	9968 lb/hr	13094 ton/yr	11623 lb/hr	10282 lb/hr	33306 ton/yr	11796 lb/hr	9877 lb/hr	28587 ton/yr	211 lb/hr <sup>3</sup>	3700 lb/hr <sup>3</sup>
Heskett 1&2 (incomplete CEM data)	2969 lb/hr	Baseline	2872 lb/hr	5956 ton/yr			2208 ton/yr			1778 ton/yr	0 <sup>3</sup>	0 <sup>1</sup>

Source	Current 24-hr avg Allowable Emission Limit	Source Type	Baseyear Emissions		1999 Actual Emissions			2000 Actual Emissions			Incr. emiss: EPA Prop. 2yr @ 90%	Incr. emiss: ND Allow- ables
			24 hr	Annual	Max 24 Hour	90 % 24 Hour	Annual	Max 24 Hour	90% 24 Hour	Annual		
Stanton Unit 1	4416 lb/hr	Baseline	4416 lb/hr	8018 ton/yr	3078 lb/hr	2371 lb/hr	8241 tons/yr <sup>4</sup>	3047 lb/hr	2523 lb/hr	7017 ton/yr <sup>4</sup>	0	0
Stanton Unit 10	Included in Unit 1 total	PSD	NA	NA	357 lb/hr	327 lb/hr	1241 tons/yr <sup>4</sup>	402 lb/hr	307 lb/hr	972 ton/yr <sup>4</sup>	320 lb/hr	0
<b>Total</b>											23445 lb/hr	27708 lb/hr

- 1) 3- hour rolling average limit
- 2) Full allowable emissions were assumed by ND in 1978-1979 baseyears
- 3) Credit applied using ND's calculation of baseyear emissions. (The State's calculation does not seem to reflect emissions growth in these sources since baseline date). Totals in some cases reflect actual emissions exceeding allowable limits.
- 4) Sum of reported CEM data. May understate annual emissions due to missing CEM data.

KG 6/8/01



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08/20/01 08:33 AM

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Subject: Effect of controls at MR Young Station on PSD Class 1 Increment

I reran North Dakota's original PSD increment modeling analysis to estimate the effect of emission reductions at Milton R Young Station on the Class 1 areas in ND and MT where violations of the SO<sub>2</sub> increment have been predicted. This analysis relied on North Dakota's assumption that MRY emitted "allowable emissions" of 37,791 tons per year in the 1977-1978 baseline period. The only emission changes at MRY in subsequent years that would consume PSD increment are those exceeding this level. Conversely, only emission reductions greater than 37,791 tons/year would expand, or increase, the amount of available PSD increment. An emission limit of 0.10 lbs/MMBTU SO<sub>2</sub> for both units at MRY would result in an a reduction in allowable emissions of 53,000 tons/year. A reduction of 53,000 tons/year would provide 15,214 ton/year of increment expanding emissions. Thus, the results in the attached table reflect MRY SO<sub>2</sub> increment expansion "credits" of 15,214 ton/year.

Because I used North Dakota modeling assumption concerning MRY emissions, the results probably underestimate the increment benefits MRY controls would have. CEM data for MRY shows that the facilities actual emissions exceeded the stated allowable emissions in recent years, while other information indicate that 1977-1978 baseline emissions may have been overestimated. EPA will be reanalyzing the Class 1 increment in North Dakota using updated information on MRY and other major sources later this year. If necessary, I can rerun the effect of MRY controls at that time.

The attached table shows that both the number of violations and PSD increment concentrations are reduced in all 4 Class 1 areas. Because existing violations are not as severe at Medicine Lake Wilderness and Ft. Peck Reservation, the MRY reductions provide relatively large improvements in these areas. The MRY reductions did not completely mitigate the violations in these areas. However, additional SO<sub>2</sub> emission reductions (beyond the 15,214 tons modeled) from MRY or other nearby source of 1700 tons/year would eliminate the PSD violations at MLWA, while an additional 8500 tons would eliminate violations at FPIA.



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Table 1. Calpuff modeling analysis showing the effect of feasible SO<sub>2</sub> reductions at Milton R Young Station on 24-hour average PSD exceedences in 4 Class 1 areas.

PSD Class 1 Area	Original Modeling Results <sup>1</sup> (ug/m <sup>3</sup> )			Results with MRY Controlled (ug/m <sup>3</sup> ) <sup>2</sup>		
	24 hr high	24 hr 2nd high	Number Exceeds	24 hr high	24 hr 2nd high	Number Exceeds
T. Roosevelt Natl Park, ND	17.2	12.4	19	16.3	11.4	17
Lostwood Wilderness, ND	8.3	7.2	7	7.2	5.8	6
Medicine Lake W A, MT	9.1	6.0	3	7.8	5.1	2 <sup>3</sup>
Fort Peck Reservation, MT	11.0	6.4	3	10.5	5.5	2 <sup>4</sup>

1. Data extracted from North Dakota Dept Health 5/24/99 Calpuff modeling analysis of PSD Class 1 increment consumption. Results reflect ND's assumption that MRY Station currently has no increment consuming emissions (i.e. MRY is a baseline source).

2. Both units at MRY assumed controlled to 0.1 lbs/MMBTU SO<sub>2</sub>. Increment is expanded (i.e. created) due to emission reductions of 15,214 tons/year below 1978 baseline levels.

3. Additional emission reductions of 1700 tons/year from MRY or other nearby source would eliminate the PSD Class 1 violation at MLWA.

4. Additional emission reductions of 8500 tons from MRY or other nearby source would eliminate the PSD Class 1 violations at FPR.

## ATTACHMENT 2

From the Energy Information Agency's Annual Energy Review Data

<http://tonto.eia.doe.gov/aer/index2000.htm>

Data is for Contiguous U.S.

	Summer Peak Load (millions of kW)	Annual Electricity Consumption billion kW-h
1986	476,983.00	2,487.31
1987	496,173.00	2,572.13
1988	529,460.00	2,704.25
1989	523,082.00	2,784.30
1990	546,000.00	2,808.15
1991	552,176.00	2,825.02
1992	549,211.00	2,797.22
1993	581,264.00	2,882.52
1994	585,844.00	2,910.71
1995	620,871.00	2,994.53
1996	616,790.00	3,077.44
1997	637,677.00	3,122.52
1998	660,293.00	3,212.17
1999	681,449.00	3,173.67
2000	685,816.00	3,009.51

Rate of Growth in Peak Summer Load 1986 to 2000

44 %

Rate of Growth in Annual Electricity Consumption 1986 to 2000

21 %